



SEQUENCE LISTING

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Rossomando, Anthony
Johansen, Teit E.

<120> NOVEL NEUROTROPHIC FACTORS

<130> 13751-056001

<140> US 10/661,984

<141> 2003-09-12

<150> US 09/804,615

<151> 2001-03-12

<150> PCT/EP02/02691

<151> 2002-03-12

<160> 76

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 865

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (120)...(719)

<221> 5'UTR

<222> (1)...(119)

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<221> sig_peptide

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<222> (405)...(719)

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tccccaaagcc cacctgggtg ccccttttct ccttgaggct ccacttggtc tctccgcgc	119
atg cct gcc ctg tgg ccc acc ctg gcc gct ctg gct ctg ctg agc agc	167
Met Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu Leu Ser Ser	
-20 -15 -10 -5	

gtc gca gag gcc tcc ctg ggc tcc gcg ccc cgc agc cct gcc ccc cgc	215
Val Ala Glu Ala Ser Leu Gly Ser Ala Ala Pro Arg Ser Pro Ala Pro Arg	
1 5 10	

gaa ggc ccc ccg cct gtc ctg gcg tcc ccc gcc ggc cac ctg ccg ggg	263
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Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu Pro Gly	
15 20 25	
gga cgc acg gcc cgc tgg tgc agt gga aga gcc cgg cgg ccg cgc cgc	311
Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg Pro Arg Arg	
30 35 40	
aga cac ttc tcg gcc cgc gcc ccc gcc gcc tgc acc ccc atc tgc tct	359
Arg His Phe Ser Ala Arg Ala Pro Ala Ala Cys Thr Pro Ile Cys Ser	
45 50 55 60	
tcc ccg cgg gtc cgc gcg gcg cgg ctg ggg ggc cgg gca gcg cgc tcg	407
Ser Pro Arg Val Arg Ala Ala Arg Leu Gly Gly Arg Ala Ala Arg Ser	
65 70 75	
ggc agc ggg ggc gcg ggg tgc cgc ctg cgc tcg cag ctg gtg ccg gtg	455
Gly Ser Gly Gly Ala Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val	
80 85 90	
cgc gcg ctc ggc ctg ggc cac cgc tcc gac gag ctg gtg cgt ttc cgc	503
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg	
95 100 105	
ttc tgc acc ggc tcc tgc ccg cgc gcg cgc tct cca cac gac ctc agc	551
Phe Cys Thr Gly Ser Cys Pro Arg Ala Arg Ser Pro His Asp Leu Ser	
110 115 120	
ctg gcc agc cta ctg ggc gcc ggg gcc ctg cga ccg ccc ccg ggc tcc	599
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser	
125 130 135 140	
cgg ccc gtc agc cag ccc tgc tgc cga ccc acg cgc tac gaa gcg gtc	647
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val	
145 150 155	
tcc ttc atg gac gtc aac agc acc tgg aga acc gtg gac cgc ctc tcc	695
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser	
160 165 170	
gcc acc gcc tgc ggc tgc ctg ggc tgagggctcg ctccagggct ttgcagactg	749
Ala Thr Ala Cys Gly Cys Leu Gly	
175 180	
gacccttacc ggtggctctt cctgcctggg accctcccgc agagtcccac tagccagcgg	809
cctcagccag ggacgaaggc ctcaaagctg agaggcccct gccggtgggt gatgga	865
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<213> Homo sapiens	
<220>	
<221> SIGNAL	
<222> (1)...(20)	
<400> 2	
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-20          -15          -10          -5
Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro Ala Pro Arg
      1          5          10
Glu Gly Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu Pro Gly
      15          20          25
Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg Pro Arg Arg
      30          35          40
Arg His Phe Ser Ala Arg Ala Pro Ala Ala Cys Thr Pro Ile Cys Ser
      45          50          55          60
Ser Pro Arg Val Arg Ala Ala Arg Leu Gly Gly Arg Ala Ala Arg Ser
      65          70          75
Gly Ser Gly Gly Ala Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
      80          85          90
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
      95          100          105
Phe Cys Thr Gly Ser Cys Pro Arg Ala Arg Ser Pro His Asp Leu Ser
      110          115          120
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
      125          130          135          140
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
      145          150          155
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
      160          165          170
Ala Thr Ala Cys Gly Cys Leu Gly
      175          180

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<210> 3
<211> 861
<212> DNA
<213> Homo sapiens

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<220>
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<222> (7)...(717)

<221> 5'UTR
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<221> sig_peptide
<222> (7)...(174)

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<221> mat_peptide
<222> (298)...(717)

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      Met Pro Gly Leu Ile Ser Ala Arg Gly Gln Pro Leu Leu Glu
      -55          -50          -45

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gtc ctt cct ccc caa gcc cac ctg ggt gcc ctc ttt ctc cct gag gct Val Leu Pro Pro Gln Ala His Leu Gly Ala Leu Phe Leu Pro Glu Ala -40 -35 -30	96
cca ctt ggt ctc tcc gcg cag cct gcc ctg tgg ccc acc ctg gcc gct Pro Leu Gly Leu Ser Ala Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala -25 -20 -15	144
ctg gct ctg ctg agc agc gtc gca gag gcc tcc ctg ggc tcc gcg ccc Leu Ala Leu Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro -10 -5 1 5	192
cgc agc cct gcc ccc cgc gaa ggc ccc ccg cct gtc ctg gcg tcc ccc Arg Ser Pro Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro 10 15 20	240
gcc ggc cac ctg ccg ggg gga cgc acg gcc cgc tgg tgc agt gga aga Ala Gly His Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg 25 30 35	288
gcc cgg cgg ccg ccg ccg cag cct tct cgg ccc gcg ccc ccg ccg cct Ala Arg Arg Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro 40 45 50	336
gca ccc cca tct gct ctt ccc cgc ggg ggc cgc gcg gcg cgg gct ggg Ala Pro Pro Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly 55 60 65 70	384
ggc ccg ggc aac cgc gct cgg gca gcg ggg gcg cgg ggc tgc cgc ctg Gly Pro Gly Asn Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu 75 80 85	432
cgc tcg cag ctg gtg ccg gtg cgc gcg ctc ggc ctg ggc cac cgc tcc Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser 90 95 100	480
gac gag ctg gtg cgt ttc cgc ttc tgc agc ggc tcc tgc cgc cgc gcg Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala 105 110 115	528
cgc tct cca cac gac ctc agc ctg gcc agc cta ctg ggc gcc ggg gcc Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Gly Ala Gly Ala 120 125 130	576
ctg cga ccg ccc ccg ggc tcc cgg ccc gtc agc cag ccc tgc tgc cga Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg 135 140 145 150	624
ccc acg cgc tac gaa gcg gtc tcc ttc atg gac gtc aac agc acc tgg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp 155 160 165	672
aga acc gtg gac cgc ctc tcc gcc aac ccc tgc ggc tgc ctg ggc Arg Thr Val Asp Arg Leu Ser Ala Asn Pro Cys Gly Cys Leu Gly 170 175 180	717

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tgagggctcg ctccagggct ttgcagactg gacccttacc ggtggctctt cctgcctggg 777
accctcccg c agagtccac tagccagcgg cctcagccag ggacgaaggc ctcaaagctg 837
agagggccct gccgggtgggt gatg 861

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<210> 4
<211> 237
<212> PRT
<213> Homo sapiens

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<220>
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<222> (1)...(56)

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Pro Pro Gln Ala His Leu Gly Ala Leu Phe Leu Pro Glu Ala Pro Leu
-40 -35 -30 -25
Gly Leu Ser Ala Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala
-20 -15 -10
Leu Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser
-5 1 5
Pro Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly
10 15 20
His Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg
25 30 35 40
Arg Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Ala Pro
45 50 55
Pro Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro
60 65 70
Gly Asn Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser
75 80 85
Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu
90 95 100
Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser
105 110 115 120
Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg
125 130 135
Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr
140 145 150
Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr
155 160 165
Val Asp Arg Leu Ser Ala Asn Pro Cys Gly Cys Leu Gly
170 175 180

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<210> 5
<211> 140
<212> PRT
<213> Homo sapiens

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<220>
<221> VARIANT
<222> 134
<223> Xaa = Asn or Thr

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<221> VARIANT
<222> 135

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<223> Xaa = Ala or Pro

<400> 5

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Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro
 1           5           10           15
Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly
      20           25           30
Asn Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
      35           40           45
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
      50           55           60
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
65           70           75           80
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
      85           90           95
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
      100          105          110
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
      115          120          125
Asp Arg Leu Ser Ala Xaa Xaa Cys Gly Cys Leu Gly
      130          135          140

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<210> 6

<211> 116

<212> PRT

<213> Homo sapiens

<220>

<221> VARIANT

<222> 110

<223> Xaa = Asn or Thr

<221> VARIANT

<222> 111

<223> Xaa = Ala or Pro

<400> 6

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Ala Ala Arg Ala Gly Gly Pro Gly Asn Arg Ala Arg Ala Ala Gly Ala
 1           5           10           15
Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly
      20           25           30
Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly
      35           40           45
Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu
      50           55           60
Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser
65           70           75           80
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
      85           90           95
Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Xaa Xaa Cys
      100          105          110
Gly Cys Leu Gly
      115

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<210> 7

<211> 113

<212> PRT

<213> Homo sapiens

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<221> VARIANT

<222> 107

<223> Xaa = Asn or Thr

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<223> Xaa = Ala or Pro

<400> 7

Ala	Gly	Gly	Pro	Gly	Asn	Arg	Ala	Arg	Ala	Ala	Gly	Ala	Arg	Gly	Cys
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Arg	Leu	Arg	Ser	Gln	Leu	Val	Pro	Val	Arg	Ala	Leu	Gly	Leu	Gly	His
		20					25					30			
Arg	Ser	Asp	Glu	Leu	Val	Arg	Phe	Arg	Phe	Cys	Ser	Gly	Ser	Cys	Arg
	35					40				45					
Arg	Ala	Arg	Ser	Pro	His	Asp	Leu	Ser	Leu	Ala	Ser	Leu	Leu	Gly	Ala
	50				55					60					
Gly	Ala	Leu	Arg	Pro	Pro	Pro	Gly	Ser	Arg	Pro	Val	Ser	Gln	Pro	Cys
65				70				75					80		
Cys	Arg	Pro	Thr	Arg	Tyr	Glu	Ala	Val	Ser	Phe	Met	Asp	Val	Asn	Ser
			85					90					95		
Thr	Trp	Arg	Thr	Val	Asp	Arg	Leu	Ser	Ala	Xaa	Xaa	Cys	Gly	Cys	Leu
			100				105						110		

Gly

<210> 8

<211> 861

<212> DNA

<213> Homo sapiens

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<221> CDS

<222> (58)...(717)

<221> 5'UTR

<222> (1)...(57)

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<221> mat_peptide

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<221> mat_peptide

<222> (379)...(717)

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Met

gaa ctt gga ctt gga ggc ctc tcc acg ctg tcc cac tgc ccc tgg cct 108
Glu Leu Gly Leu Gly Gly Leu Ser Thr Leu Ser His Cys Pro Trp Pro
-35 -30 -25

agg cgg cag cct gcc ctg tgg ccc acc ctg gcc gct ctg gct ctg ctg 156
Arg Arg Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu Leu
-20 -15 -10

agc agc gtc gca gag gcc tcc ctg ggc tcc gcg ccc cgc agc cct gcc 204
Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro Ala
-5 1 5 10

ccc cgc gaa ggc ccc ccg cct gtc ctg gcg tcc ccc gcc ggc cac ctg 252
Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu
15 20 25

ccg ggg gga cgc acg gcc cgc tgg tgc agt gga aga gcc cgg cgg ccg 300
Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg Pro
30 35 40

ccg ccg cag cct tct cgg ccc gcg ccc ccg ccg cct gca ccc cca tct 348
Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro Ser
45 50 55

gct ctt ccc cgc ggg ggc cgc gcg gcg cgg gct ggg ggc ccg ggc agc 396
Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly Ser
60 65 70

cgc gct cgg gca gcg ggg gcg cgg ggc tgc cgc ctg cgc tcg cag ctg 444
Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu
75 80 85 90

gtg ccg gtg cgc gcg ctc ggc ctg ggc cac cgc tcc gac gag ctg gtg 492
Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val
95 100 105

cgt ttc cgc ttc tgc agc ggc tcc tgc cgc cgc gcg cgc tct cca cac 540
Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His
110 115 120

gac ctc agc ctg gcc agc cta ctg ggc gcc ggg gcc ctg cga ccg ccc 588
Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro
125 130 135

ccg ggc tcc cgg ccc gtc agc cag ccc tgc tgc cga ccc acg cgc tac 636
Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr
140 145 150

gaa gcg gtc tcc ttc atg gac gtc aac agc acc tgg aga acc gtg gac 684
Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp
155 160 165 170

cgc ctc tcc gcc acc gcc tgc ggc tgc ctg ggc tgagggctcg ctccagggct 737

Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
 175 180

ttgcagactg gacccttacc ggtggctctt cctgcctggg accctcccgc agagtccac 797
 tagccagcgg cctcagccag ggacgaaggc ctcaaagctg agaggcccct accggtgggt 857
 gatg 861

<210> 9
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 <212> PRT
 <213> Homo sapiens

<220>
 <221> SIGNAL
 <222> (1)...(39)

<221> MOD_RES
 <222> 163
 <223> glycosylated asparagine residue

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 Pro Arg Arg Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu
 -20 -15 -10
 Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro
 -5 1 5
 Ala Pro Arg Glu Gly Pro Pro Val Leu Ala Ser Pro Ala Gly His
 10 15 20 25
 Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg
 30 35 40
 Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro
 45 50 55
 Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly
 60 65 70
 Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
 75 80 85
 Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
 90 95 100 105
 Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
 110 115 120
 His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
 125 130 135
 Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
 140 145 150
 Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
 155 160 165
 Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
 170 175 180

<210> 10
 <211> 140
 <212> PRT
 <213> Homo sapiens

<220>
 <221> MOD_RES

<222> 122
 <223> glycosylated asparagine residue

<400> 10

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Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro
1          5          10          15
Ser Ala Leu Pro Arg Gly Gly Arg Ala Arg Ala Gly Gly Pro Gly
          20          25          30
Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
          35          40          45
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
          50          55          60
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
65          70          75          80
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
          85          90          95
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
          100          105          110
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
          115          120          125
Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
          130          135          140

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<210> 11
 <211> 116
 <212> PRT
 <213> Homo sapiens

<220>
 <221> MOD_RES
 <222> 98
 <223> glycosylated asparagine residue

<400> 11

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Ala Ala Arg Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala
1          5          10          15
Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly
          20          25          30
Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly
          35          40          45
Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu
          50          55          60
Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser
65          70          75          80
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
          85          90          95
Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys
          100          105          110
Gly Cys Leu Gly
          115

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<210> 12
 <211> 113
 <212> PRT
 <213> Homo sapiens

<220>

<221> MOD_RES
 <222> 95
 <223> glycosylated asparagine residue

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 1 5 10 15
 Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His
 20 25 30
 Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg
 35 40 45
 Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala
 50 55 60
 Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys
 65 70 75 80
 Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser
 85 90 95
 Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu
 100 105 110
 Gly

<210> 13
 <211> 102
 <212> DNA
 <213> Homo sapiens

<400> 13
 cctggccagc ctactgggcg ccggggccct gcgaccgccc ccgggctccc ggcccgtcag 60
 ccagccctgc tgccgaccca cgcgctacga agcgggtctcc tt 102

<210> 14
 <211> 220
 <212> DNA
 <213> Mus musculus

<400> 14
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 cgctcccagc acgatctcag tctggccagc ctactgggcg ctggggccct acggtcgcct 120
 cccgggtccc ggccgatcag ccagccctgc tgccggccc ctcgctatga ggccgtctcc 180
 ttcattggacg tgaacagcac ctggagaacc gtggaccgcc 220

<210> 15
 <211> 2136
 <212> DNA
 <213> Mus musculus

<220>
 <221> CDS
 <222> (975)...(1646)

<400> 15
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 cggatccgga ggggtggagcg gccaggtgag ccctgaaagg tggggcgggg cgggggcgct 180
 ctggggccca ccccgggatc tggtagcgcc ggggctggaa tttgacaccg gacggcggcg 240
 ggcaggaggc tgctgagggg tggagttggg ctcggccccc agatgcggcc cgcgggctct 300

gccagcaaca agtccctcgg gccccagccc tcgctgcgac tggggccttgg agccctgcac	360
ccaagggcac agaccggctg ccaaggcccc acttttaact aaaagaggcg ctgccagggtg	420
cacaactctg ggcgatgatcc acttgagctt cgggggaaag cccagcactg gtcccaggag	480
aggcgcctag aaggacacgg accaggacccc ctttggtatg gagtgaacgc tgagcatgga	540
gtggaaggaa ctcaagttac tactttctcc aaccaccctg gtaccttcag ccctgaagta	600
cagagcagaa gggctcttaga agacaggacc acagctgtgt gagtctcccc cctgaggcct	660
tagacgatct ctgagctcag ctgagctttg tttgcccatac tggagaagtg agccattgat	720
tgaccttggtg gcatcgcgaa ggaacagggtc ctgccaagca cctaacacag agagcaagggt	780
tctccatcgc agctaccgct gctgagttga ctctagctac tccaacctcc tgggtcgctt	840
cgagagactg gagtggaaagg aggaataccc caaaggataa ctaactcacc tttcagtttg	900
caagctgccg caggaagagg gtgggggaaac ggggtccacga aggcttctga tgggagcttc	960
tggagccgaa agct atg gaa ctg gga ctt gca gag cct act gca ttg tcc	1010
Met Glu Leu Gly Leu Ala Glu Pro Thr Ala Leu Ser	
1 5 10	
cac tgc ctc cgg cct agg tgg cag tca gcc tgg tgg cca acc cta gct	1058
His Cys Leu Arg Pro Arg Trp Gln Ser Ala Trp Trp Pro Thr Leu Ala	
15 20 25	
gtt cta gcc ctg ctg agc tgc gtc aca gaa gct tcc ctg gac cca atg	1106
Val Leu Ala Leu Leu Ser Cys Val Thr Glu Ala Ser Leu Asp Pro Met	
30 35 40	
tcc cgc agc ccc gcc gct cgc gac ggt ccc tca ccg gtc ttg gcg ccc	1154
Ser Arg Ser Pro Ala Ala Arg Asp Gly Pro Ser Pro Val Leu Ala Pro	
45 50 55 60	
ccc acg gac cac ctg cct ggg gga cac act gcg cat ttg tgc agc gaa	1202
Pro Thr Asp His Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu	
65 70 75	
aga acc ctg cga ccc ccg cct cag tct cct cag ccc gca ccc ccg ccg	1250
Arg Thr Leu Arg Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro	
80 85 90	
cct ggt ccc gcg ctc cag tct cct ccc gct gcg ctc cgc ggg gca cgc	1298
Pro Gly Pro Ala Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg	
95 100 105	
gcg gcg cgt gca gga acc cgg agc agc cgc gca cgg acc aca gat gcg	1346
Ala Ala Arg Ala Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp Ala	
110 115 120	
cgc ggc tgc cgc ctg cgc tcg cag ctg gtg ccg gtg agc gcg ctc ggc	1394
Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly	
125 130 135 140	
cta ggc cac agc tcc gac gag ctg ata cgt ttc cgc ttc tgc agc ggc	1442
Leu Gly His Ser Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly	
145 150 155	
tcg tgc cgc cga gca cgc tcc cag cac gat ctc agt ctg gcc agc cta	1490
Ser Cys Arg Arg Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser Leu	
160 165 170	
ctg ggc gct ggg gcc cta cgg tcg cct ccc ggg tcc ccg ccg atc agc	1538
Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser	

175	180	185	
cag ccc tgc tgc cgg ccc act cgc tat gag gcc gtc tcc ttc atg gac			1586
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp			
190	195	200	
gtg aac agc acc tgg agg acc gtg gac cac ctc tcc gcc act gcc tgc			1634
Val Asn Ser Thr Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys			
205	210	215	220
ggc tgt ctg ggc tgaggatgat ctatctccaa gcctttgcac actagaccca			1686
Gly Cys Leu Gly			

tgtgttgccc tacctggaac agctccaccg ggctcacta accaggagcc tcaactcagc	1746
aggatatgga ggctgcagag ctcaggcccc aggcgggtga gtgacagacg tcgtcggcat	1806
gacagacaga gtgaaagatg tcggaaccac tgaccaacag tcccaagttg ttcattggatc	1866
ccagctctac agacaggaga aacctcagct aaagagaact cctctgggag aatccagaaa	1926
tggccctctg tcctggggaa tgaattttga agagatatat atacatatat acattgtagt	1986
cgcgttgctg gaccagcctg tgctgaaacc agtcccgtgt tcacttgtgg aagccgaagc	2046
cctattttatt atttctaaat tattttattta ctttgaaaaa aaacggccaa gtcggcctcc	2106
ctttagttag gggttaatttg tgatcccggg	2136

<210> 16
 <211> 224
 <212> PRT
 <213> Mus musculus

<400> 16	
Met Glu Leu Gly Leu Ala Glu Pro Thr Ala Leu Ser His Cys Leu Arg	
1	15
Pro Arg Trp Gln Ser Ala Trp Trp Pro Thr Leu Ala Val Leu Ala Leu	
20	30
Leu Ser Cys Val Thr Glu Ala Ser Leu Asp Pro Met Ser Arg Ser Pro	
35	45
Ala Ala Arg Asp Gly Pro Ser Pro Val Leu Ala Pro Pro Thr Asp His	
50	60
Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu Arg Thr Leu Arg	
65	80
Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro Pro Gly Pro Ala	
85	95
Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg Ala Ala Arg Ala	
100	110
Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp Ala Arg Gly Cys Arg	
115	125
Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly Leu Gly His Ser	
130	140
Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg	
145	160
Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly	
165	175
Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys	
180	190
Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr	
195	205
Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly	
210	220

<210> 17
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 17
 cctggccagc ctactggg 18

<210> 18
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 18
 aaggagaccg cttcgtagcg 20

<210> 19
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 19
 atggaacttg gacttgg 17

<210> 20
 <211> 16
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 20
 tccatcaccc accggc 16

<210> 21
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 21
 ggccaccgct ccgacgag 18

<210> 22

<211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 22
 ggcggtccac gggttctccag 20

<210> 23
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 23
 ccaagcccac ctgggtgccc tctttctcc 29

<210> 24
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 24
 catcaccac cggcaggggc ctctcag 27

<210> 25
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 25
 gagcccatgc ccggcctgat ctcagcccga ggaca 35

<210> 26
 <211> 34
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 26
 ccctggctga ggccgctggc tagtgggact ctgc 34

<210> 27
 <211> 31
 <212> DNA

<213> Artificial Sequence

<220>

<223> probe

<221> misc_feature

<222> 1

<223> n = A, T, G, or C

<400> 27

ncaggtggtc cgtggggggc gccaaagaccg g

31

<210> 28

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 28

ctaggagccc atgccc

16

<210> 29

<211> 351

<212> DNA

<213> Homo sapiens

<400> 29

atggctggag gaccgggatac tcgtgctcgt gcagcaggag cacgtggctg tcgtctgcgt	60
tctcaactag tgccggtgcg tgcactcgga ctgggacacc gttccgacga actagtagct	120
tttcgttttt gtccaggatac ttgtcgtcgt gcacgtttct cgcattgatc atctctagca	180
tctctactag gagccggagc actaagaccg ccgccgggat ctagacctgt atctcaacct	240
tggtgtagac ctactagata cgaagcagta tctttcatgg acgtaaactc tacatggaga	300
accgtagata gactatctgc aaccgcattg ggctgtctag gatgataata g	351

<210> 30

<211> 414

<212> DNA

<213> Homo sapiens

<400> 30

atgggccatc atcatcatca tcatcatcat catcactcga gcggccatat cgacgacgac	60
gacaaggctg gaggaccggg atctcgtgct cgtgcagcag gacacgtgg ctgtcgtctg	120
cgttctcaac tagtgccggg gcgtgcactc ggactgggac accgttccga cgaactagta	180
cgttttcgtt tttgttcagg atcttgctgt cgtgcacgtt ctccgcatga tctatctcta	240
gcattctctac taggagccgg agcactaaga ccgccgccgg gatctagacc tgtatctcaa	300
ccttggttgta gacctactag atacgaagca gtatctttca tggacgtaaa ctctacatgg	360
agaaccgtag atagactatc tgcaaccgca tgtggctgtc taggatgata atag	414

<210> 31

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 31
aaggaaaaaa gcggccgcca tggaacttgg acttggagg 39

<210> 32
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 32
ttttttcctt ggcgcccgct cagcccaggc agccgcagg 39

<210> 33
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 33
gagcgagccc tcagcc 16

<210> 34
<211> 224
<212> PRT
<213> Rattus norvegicus

<400> 34
Met Glu Leu Gly Leu Gly Glu Pro Thr Ala Leu Ser His Cys Leu Arg
1 5 10 15
Pro Arg Trp Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu
20 25 30
Leu Ser Ser Val Thr Glu Ala Ser Leu Asp Pro Met Ser Arg Ser Pro
35 40 45
Ala Ser Arg Asp Val Pro Ser Pro Val Leu Ala Pro Pro Thr Asp Tyr
50 55 60
Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu Arg Ala Leu Arg
65 70 75 80
Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro Gly Pro Ala
85 90 95
Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg Ala Ala Arg Ala
100 105 110
Gly Thr Arg Ser Ser Arg Ala Arg Ala Thr Asp Ala Arg Gly Cys Arg
115 120 125
Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly Leu Gly His Ser
130 135 140
Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg
145 150 155 160
Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly
165 170 175
Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys
180 185 190
Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr

	195		200		205										
Trp	Arg	Thr	Val	Asp	His	Leu	Ser	Ala	Thr	Ala	Cys	Gly	Cys	Leu	Gly
	210					215					220				

<210> 35
 <211> 112
 <212> PRT
 <213> Homo sapiens

<400> 35
 Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg
 1 5 10 15
 Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg
 20 25 30
 Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg
 35 40 45
 Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly
 50 55 60
 Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys
 65 70 75 80
 Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr
 85 90 95
 Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
 100 105 110

<210> 36
 <211> 111
 <212> PRT
 <213> Homo sapiens

<400> 36
 Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu
 1 5 10 15
 Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser
 20 25 30
 Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala
 35 40 45
 Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala
 50 55 60
 Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg
 65 70 75 80
 Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp
 85 90 95
 Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
 100 105 110

<210> 37
 <211> 110
 <212> PRT
 <213> Homo sapiens

<400> 37
 Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg
 1 5 10 15
 Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp
 20 25 30
 Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg

```

      35      40      45
Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu
  50      55      60
Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro
  65      70      75      80
Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg
      85      90      95
Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
      100      105      110

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<210> 38
 <211> 109
 <212> PRT
 <213> Homo sapiens

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<400> 38
Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser
  1      5      10      15
Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu
      20      25      30
Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser
      35      40      45
Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg
      50      55      60
Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr
  65      70      75      80
Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr
      85      90      95
Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
      100      105

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<210> 39
 <211> 108
 <212> PRT
 <213> Homo sapiens

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<400> 39
Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
  1      5      10      15
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
      20      25      30
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
      35      40      45
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
      50      55      60
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
  65      70      75      80
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
      85      90      95
Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
      100      105

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<210> 40
 <211> 107
 <212> PRT
 <213> Homo sapiens

<400> 40

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Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu
 1          5          10          15
Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val
          20          25          30
Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His
          35          40          45
Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro
          50          55          60
Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr
65          70          75          80
Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp
          85          90          95
Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
          100          105

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<210> 41

<211> 106

<212> PRT

<213> Homo sapiens

<400> 41

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Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val
 1          5          10          15
Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg
          20          25          30
Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp
          35          40          45
Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro
          50          55          60
Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu
65          70          75          80
Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg
          85          90          95
Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
          100          105

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<210> 42

<211> 105

<212> PRT

<213> Homo sapiens

<400> 42

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Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro
 1          5          10          15
Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe
          20          25          30
Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu
          35          40          45
Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly
          50          55          60
Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala
65          70          75          80
Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu
          85          90          95
Ser Ala Thr Ala Cys Gly Cys Leu Gly
          100          105

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<210> 43
 <211> 104
 <212> PRT
 <213> Homo sapiens

<400> 43
 Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
 1 5 10 15
 Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
 20 25 30
 Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser
 35 40 45
 Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
 50 55 60
 Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
 65 70 75 80
 Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
 85 90 95
 Ala Thr Ala Cys Gly Cys Leu Gly
 100

<210> 44
 <211> 103
 <212> PRT
 <213> Homo sapiens

<400> 44
 Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg
 1 5 10 15
 Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe
 20 25 30
 Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu
 35 40 45
 Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg
 50 55 60
 Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser
 65 70 75 80
 Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala
 85 90 95
 Thr Ala Cys Gly Cys Leu Gly
 100

<210> 45
 <211> 102
 <212> PRT
 <213> Homo sapiens

<400> 45
 Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala
 1 5 10 15
 Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys
 20 25 30
 Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala
 35 40 45
 Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro
 50 55 60

Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe
 65 70 75 80
 Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr
 85 90 95
 Ala Cys Gly Cys Leu Gly
 100

<210> 46
 <211> 101
 <212> PRT
 <213> Homo sapiens

<400> 46
 Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu
 1 5 10 15
 Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser
 20 25 30
 Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser
 35 40 45
 Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val
 50 55 60
 Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met
 65 70 75 80
 Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala
 85 90 95
 Cys Gly Cys Leu Gly
 100

<210> 47
 <211> 100
 <212> PRT
 <213> Homo sapiens

<400> 47
 Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly
 1 5 10 15
 Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly
 20 25 30
 Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu
 35 40 45
 Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser
 50 55 60
 Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
 65 70 75 80
 Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys
 85 90 95
 Gly Cys Leu Gly
 100

<210> 48
 <211> 99
 <212> PRT
 <213> Homo sapiens

<400> 48
 Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu
 1 5 10 15

Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser
 20 25 30
 Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu
 35 40 45
 Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln
 50 55 60
 Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val
 65 70 75 80
 Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly
 85 90 95
 Cys Leu Gly

<210> 49
 <211> 197
 <212> PRT
 <213> Homo sapiens

<400> 49
 Met Gln Arg Trp Lys Ala Ala Ala Leu Ala Ser Val Leu Cys Ser Ser
 1 5 10 15
 Val Leu Ser Ile Trp Met Cys Arg Glu Gly Leu Leu Leu Ser His Arg
 20 25 30
 Leu Gly Pro Ala Leu Val Pro Leu His Arg Leu Pro Arg Thr Leu Asp
 35 40 45
 Ala Arg Ile Ala Arg Leu Ala Gln Tyr Arg Ala Leu Leu Gln Gly Ala
 50 55 60
 Pro Asp Ala Met Glu Leu Arg Glu Leu Thr Pro Trp Ala Gly Arg Pro
 65 70 75 80
 Pro Gly Pro Arg Arg Arg Ala Gly Pro Arg Arg Arg Ala Arg Ala
 85 90 95
 Arg Leu Gly Ala Arg Pro Cys Gly Leu Arg Glu Leu Glu Val Arg Val
 100 105 110
 Ser Glu Leu Gly Leu Gly Tyr Ala Ser Asp Glu Thr Val Leu Phe Arg
 115 120 125
 Tyr Cys Ala Gly Ala Cys Glu Ala Ala Ala Arg Val Tyr Asp Leu Gly
 130 135 140
 Leu Arg Arg Leu Arg Gln Arg Arg Arg Leu Arg Arg Glu Arg Val Arg
 145 150 155 160
 Ala Gln Pro Cys Cys Arg Pro Thr Ala Tyr Glu Asp Glu Val Ser Phe
 165 170 175
 Leu Asp Ala His Ser Arg Tyr His Thr Val His Glu Leu Ser Ala Arg
 180 185 190
 Glu Cys Ala Cys Val
 195

<210> 50
 <211> 156
 <212> PRT
 <213> Homo sapiens

<400> 50
 Met Ala Val Gly Lys Phe Leu Leu Gly Ser Leu Leu Leu Leu Ser Leu
 1 5 10 15
 Gln Leu Gly Gln Gly Trp Gly Pro Asp Ala Arg Gly Val Pro Val Ala
 20 25 30
 Asp Gly Glu Phe Ser Ser Glu Gln Val Ala Lys Ala Gly Gly Thr Trp
 35 40 45

Leu Gly Thr His Arg Pro Leu Ala Arg Leu Arg Arg Ala Leu Ser Gly
 50 55 60
 Pro Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala Glu Leu Gly Leu
 65 70 75 80
 Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser
 85 90 95
 Cys Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala Leu Ala Arg Leu
 100 105 110
 Gln Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys Arg Pro Thr Arg
 115 120 125
 Tyr Thr Asp Val Ala Phe Leu Asp Asp Arg His Arg Trp Gln Arg Leu
 130 135 140
 Pro Gln Leu Ser Ala Ala Ala Cys Gly Cys Gly Gly
 145 150 155

<210> 51
 <211> 211
 <212> PRT
 <213> Homo sapiens

<400> 51
 Met Lys Leu Trp Asp Val Val Ala Val Cys Leu Val Leu Leu His Thr
 1 5 10 15
 Ala Ser Ala Phe Pro Leu Pro Ala Gly Lys Arg Pro Pro Glu Ala Pro
 20 25 30
 Ala Glu Asp Arg Ser Leu Gly Arg Arg Ala Pro Phe Ala Leu Ser
 35 40 45
 Ser Asp Ser Asn Met Pro Glu Asp Tyr Pro Asp Gln Phe Asp Asp Val
 50 55 60
 Met Asp Phe Ile Gln Ala Thr Ile Lys Arg Leu Lys Arg Ser Pro Asp
 65 70 75 80
 Lys Gln Met Ala Val Leu Pro Arg Arg Glu Arg Asn Arg Gln Ala Ala
 85 90 95
 Ala Ala Asn Pro Glu Asn Ser Arg Gly Lys Gly Arg Arg Gly Gln Arg
 100 105 110
 Gly Lys Asn Arg Gly Cys Val Leu Thr Ala Ile His Leu Asn Val Thr
 115 120 125
 Asp Leu Gly Leu Gly Tyr Glu Thr Lys Glu Glu Leu Ile Phe Arg Tyr
 130 135 140
 Cys Ser Gly Ser Cys Asp Ala Ala Glu Thr Thr Tyr Asp Lys Ile Leu
 145 150 155 160
 Lys Asn Leu Ser Arg Asn Arg Arg Leu Val Ser Asp Lys Val Gly Gln
 165 170 175
 Ala Cys Cys Arg Pro Ile Ala Phe Asp Asp Asp Leu Ser Phe Leu Asp
 180 185 190
 Asp Asn Leu Val Tyr His Ile Leu Arg Lys His Ser Ala Lys Arg Cys
 195 200 205
 Gly Cys Ile
 210

<210> 52
 <211> 365
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS

<222> (5)...(346)

<400> 52

tacc atg gct gga gga ccg gga tct cgt gct cgt gca gca gga gca cgt 49
 Met Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg
 1 5 10 15

ggc tgt cgt ctg cgt tct caa cta gtg ccg gtg cgt gca ctc gga ctg 97
 Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu
 20 25 30

gga cac cgt tcc gac gaa cta gta cgt ttt cgt ttt tgt tca gga tct 145
 Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser
 35 40 45

tgt cgt cgt gca cgt tct ccg cat gat cta tct cta gca tct cta cta 193
 Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu
 50 55 60

gga gcc gga gca cta aga ccg ccg ccg gga tct aga cct gta tct caa 241
 Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln
 65 70 75

cct tgt tgt aga cct act aga tac gaa gca gta tct ttc atg gac gta 289
 Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val
 80 85 90 95

aac tct aca tgg aga acc gta gat aga cta tct gca acc gca tgt ggc 337
 Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly
 100 105 110

tgt cta gga tgataatagg gatccggct 365
 Cys Leu Gly

<210> 53

<211> 365

<212> DNA

<213> Homo sapiens

<400> 53

agccggatcc ctattatcat cctagacagc cacatgcggt tgcagatagt ctatctacgg 60
 ttctccatgt agagtttacg tccatgaaag atactgcttc gtatctagta ggtctacaac 120
 aaggttgaga tacagggtcta gatcccggcg gcggtcttag tgctccggct cctagtagag 180
 atgctagaga tagatcatgc ggagaacgtg caccagcaca agatcctgaa caaaaacgaa 240
 aacgtactag ttcgtcgga cgggtgtcca gtccgagtgc acgcaccggc actagttgag 300
 aacgcagacg acagccacgt gctcctgctg caccagcacg agatcccggt cctccagcca 360
 tggtta 365

<210> 54

<211> 114

<212> PRT

<213> Homo sapiens

<400> 54

Met Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly
 1 5 10 15
 Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly

[illegible]

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<210> 55
<211> 442
<212> DNA
<213> Homo sapiens
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<220>  
<221> CDS  
<222> (5) ... (409)
```

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<400> 55
tacc atg ggc cat cat cat cat cat cat cat cat cat cac tcg agc ggc      49
      Met Gly His His His His His His His His His His Ser Ser Gly
          1              5              10              15
```

cat atc gac gac gac gac aag gct gga gga ccg gga tct cgt gct cgt 97
His Ile Asp Asp Asp Asp Lys Ala Gly Gly Pro Gly Ser Arg Ala Arg
20 25 30

gca gca gga gca cgt ggc tgt cgt ctg cgt tct caa cta gtg ccg gtg 145
Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
35 40 45

cgt gca ctc gga ctg gga cac cgt tcc gac gaa cta gta cgt ttt cgt 193
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
50 55 60

ttt	tgt	tca	gga	tct	tgt	cgt	cgt	gca	cgt	tct	ccg	cat	gat	cta	tct	241
Phe	Cys	Ser	Gly	Ser	Cys	Arg	Arg	Ala	Arg	Ser	Pro	His	Asp	Leu	Ser	
	65					70					75					

cta gca tct cta cta gga gcc gga gca cta aga ccg ccg ccg gga tct 289
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
80 85 90 95

aga cct gta tct caa cct tgt tgt aga cct act aga tac gaa gca gta 337
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
100 105 110

tct ttc atg gac gta aac tct aca tgg aga acc gta gat aga cta tct 385
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
115 120 125

gca acc gca tgt ggc tgt cta gga tgataaatagg gatccggctg ctaacaaagc 439
Ala Thr Ala Cys Gly Cys Leu Gly

130

135

ccg

442

<210> 56

<211> 442

<212> DNA

<213> Homo sapiens

<400> 56

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cgggcttttgt tagcagccgg atccctatta tcatacctaga cagccacatg cggttgcaga      60
tagtctatct acggttctcc atgtagagtt tacgtccatg aaagatactg cttcgtatct      120
agtaggtcta caacaagggt gagatacagg tctagatccc ggcggcgggc ttagtgctcc      180
ggctcctagt agagatgcta gagatagatc atgcggagaa cgtgcacgac gacaagatcc      240
tgaacaaaaa cgaaaacgta ctagttcgtc ggaacgggtg cccagtccga gtgcacgcac      300
cggcactagt tgagaacgca gacgacagcc acgtgctcct gctgcacgag cacgagatcc      360
cggctcctcca gccttgctgt cgtcgtcgat atggccgctc gagtgatgat gatgatgatg      420
atgatgatga tggcccatgg ta                                         442

```

<210> 57

<211> 135

<212> PRT

<213> Homo sapiens

<400> 57

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Met Gly His His His His His His His His His Ser Ser Gly His
 1              5              10              15
Ile Asp Asp Asp Lys Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala
 20              25              30
Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg
 35              40              45
Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe
 50              55              60
Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu
 65              70              75              80
Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg
 85              90              95
Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser
100              105              110
Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala
115              120              125
Thr Ala Cys Gly Cys Leu Gly
130              135

```

<210> 58

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 58

gctggcccggt ctgcaggg

18

<210> 59

<211> 20

<212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 59
 taggccacgt cggtagcg

20

<210> 60
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 60
 gctgcgacga ctgcgcca

18

<210> 61
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 61
 aaggacacct cgtcctcgta ggc

23

<210> 62
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 62
 attgaaaaac ttatccag

18

<210> 63
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 63
 aacgacaggt catcatcaaa ggc

23

<210> 64
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
<223> exemplary motif

<400> 64
Asn Glu Gln Lys
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<210> 65
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 65
Asn His Gln Lys
1

<210> 66
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 66
Asn Asp Glu Gln
1

<210> 67
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 67
Gln His Arg Lys
1

<210> 68
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 68
Met Ile Leu Val
1

<210> 69

<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 69
Met Ile Leu Phe
1

<210> 70
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 70
Ser Thr Asn Lys
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<210> 71
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 71
Ser Thr Pro Ala
1

<210> 72
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 72
Ser Gly Asn Asp
1

<210> 73
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 73
Ser Asn Asp Glu Gln Lys

1 5

<210> 74
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> exemplary motif

<400> 74
 Asn Asp Glu Gln His Lys
 1 5

<210> 75
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> exemplary motif

<400> 75
 Asn Glu Gln His Arg Lys
 1 5

<210> 76
 <211> 86
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> consensus sequence

<221> VARIANT
 <222> 5-12, 21-51, 53, 58-79, 82, 83
 <223> Xaa = any amino acid

<221> VARIANT
 <222> 15
 <223> Xaa = Tyr or Phe

<400> 76
 Leu Gly Leu Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Arg Xaa Cys
 1 5 10 15
 Ser Gly Ser Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 20 25 30
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 35 40 45
 Xaa Xaa Xaa Gln Xaa Cys Cys Arg Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 50 55 60
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ser
 65 70 75 80
 Ala Xaa Xaa Cys Gly Cys
 85